WHAT IS CLAIMED IS:

1. A method for manufacturing a nano-gap electrode device, comprising the steps of:

forming a first electrode on a substrate;

forming a spacer on a sidewall of the first electrode;

forming a second electrode on an exposed substrate at a side of the spacer; and

forming a nano-gap between the first electrode and the second electrode by removing the spacer.

2. The method as claimed in Claim 1, wherein the substrate is a glass, an oxide, a high polymer, a silicon, a compound semiconductor, a metal, or a combination thereof.

3. The method as claimed in Claim 1, wherein the spacer is formed with the same thickness as a width of the nano-gap.

4. The method as claimed in Claim 1, wherein the spacer is formed with a thickness of 1nm to thousands of nm.

5. The method as claimed in Claim 1, wherein the spacer is formed with a material having high etching selectivity to the substrate and the first electrode.

6. The method as claimed in Claim 1, the second electrode is formed with a thickness thinner than that of the first electrode.

7. The method as claimed in Claim 1, wherein the step of forming the spacer on the sidewall of the first electrode, comprising the steps of:

depositing a separation layer with a predetermined thickness on the substrate including the first electrode; and

etching the separation layers on the top surfaces of the substrate and the first electrode while leaving the spacer on a sidewall of the first electrode, said spacer being composed of the separation layer.

8. The method as claimed in Claim 7, wherein the separation layer is deposited with the same thickness on a surface and a sidewall of the first electrode, and the substrate.

9. The method as claimed in Claim 7, wherein the separation layer is etched by means of an anisotropic dry etching method.

10. The method as claimed in Claim 1, wherein the electrode material is not deposited on the sidewall of the spacer at the time of a deposition process for forming the second electrode.

11. The method as claimed in Claim 10, wherein the deposition process is performed by means of electron beam evaporation method.

12. A method for manufacturing a nano-gap electrode device, comprising the steps of:

forming a first electrode on a substrate;

forming a separation layer with a predetermined thickness all over the substrate including the first electrode;

removing a portion or all of the separation layer on the first electrode;

forming a second electrode on the separation layer, which is formed on the substrate at a side of the first electrode; and

forming a nano-gap between the first electrode and the second electrode, by removing the separation layer remained therebetween.

13. The method as claimed in Claim 12, wherein the separation layer is formed with the same thickness as a width of the nano-gap, and deposited with the same thickness on a surface and a sidewall of the first electrode, and the substrate.

14. The method as claimed in Claim 12, wherein the separation layer is formed with a material having high etching selectivity to the substrate and the first electrode.

15. The method as claimed in Claim 12, wherein the second electrode is formed with a thickness thinner than that of the first electrode.

16. The method as claimed in Claim 12, wherein the electrode materials is not deposited on the sidewall of the separation layer at the time of a deposition process for forming the second electrode.

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